Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (withdrawn) A contaminant control system for removal of carbon dioxide and other trace contaminants from air used for environmental control comprising:

an absorber element in communication with a stripper element, the combination communicable with a power source and a control and data processor;

said absorber element having an air inlet in communication with an air source, said inlet in communication with a scrubber;

a charcoal bed filter in communication with said scrubber to receive air flow output therefrom;

said charcoal filter having an air outlet in communication with said air source;

a liquid absorbent tank in communication with said absorber element, said stripper element and an a liquid absorbent heater; and

an acid water tank in communication with said absorber element and an acid water cooler.

2. (withdrawn) The contaminant control system as in claim 1 wherein said scrubber is comprised of a rotary contact processor.

3. (withdrawn) The contaminant control system as in claim 1 wherein said stripper element is comprised of a rotary contact processor.

4. (withdrawn) The contaminant control system as in claim 2 wherein said scrubber is comprised of a carbon dioxide scrubber in fluid communication with a liquid absorbent scrubber.

5. (withdrawn) The contaminant control system as in claim 2 wherein said rotary contact processor comprises:

a carbon dioxide scrubber rotor in serial communication with a liquid absorbent scrubber rotor connected by a rotor shaft rotatably assembled on a plurality of bearings in a housing;

said carbon dioxide scrubber rotor in communication with said air inlet and a liquid absorbent inlet wherein a liquid absorbent is introduced as a mist into an air flow through said air inlet, said air flow introduced into a carbon dioxide scrubber chamber having a first heat and mass transfer surface therein of said carbon dioxide scrubber rotor;

said air flow passing through said carbon dioxide scrubber rotor through a plurality of first air passage tubes and a plurality of first mist separators to be introduced downstream into an acid wash scrubber chamber separated therefrom by a baffle and having a second heat and mass transfer surface therein;

said baffle having an acid water wash inlet for introduction of a liquid acid water wash as a mist in said air flow;

said air flow passing through said liquid absorbent scrubber rotor through a plurality of second air passage tubes and a plurality of second mist separators to a fan causing said air flow to exit said rotary contact processor through an air exhaust;

a first pitot pump in said carbon dioxide scrubber chamber for liquid absorbent circulation and exit through an a liquid absorbent outlet; and

a second pitot pump in said acid wash scrubber chamber for liquid acid water circulation and exit through an acid water outlet.

6. (withdrawn) The contaminant control system as in claim 5 wherein said liquid acid water wash is cold.

7. (withdrawn) A contaminant control system for removal of carbon dioxide and other trace contaminants from air used for environmental control in a vehicle comprising:

an absorber element rotary contact processor in communication with a stripper element rotary contact processor, the combination communicable with a power source and a control and data processor;

said absorber element having an air inlet in communication with a vehicle air source, said inlet in communication with a scrubber;

a charcoal bed filter in communication with said scrubber to receive air flow output therefrom;

said charcoal filter having an air outlet in communication with said vehicle air source;

a liquid absorbent tank in communication with said absorber element, said stripper element and an a liquid absorbent heater; and

an acid water tank in communication with said absorber element and an acid water cooler.

8. (withdrawn) A rotary contact processor for direct contact liquid absorbent and gas contaminant processing comprising:

a first scrubber rotor in serial communication with a second scrubber rotor each assembled on a rotor shaft rotatably mounted on a plurality of bearings in a housing;

said first scrubber rotor in communication with a gas inlet and a liquid absorbent inlet wherein a liquid absorbent is introduced as a mist into a gas flow through said gas inlet, said gas flow introduced into a first scrubber chamber having a first heat and mass transfer surface therein of said first scrubber rotor;

said gas flow passing through said first scrubber rotor through a plurality of first gas passage tubes and a plurality of first mist separators to be introduced downstream into a second scrubber chamber in fluid communication therewith and having a second heat and mass transfer surface therein;

said second scrubber chamber having a liquid absorbent wash inlet for introduction of a liquid absorbent wash as a mist in said gas flow;

said gas flow passing through said liquid absorbent scrubber rotor through a plurality of second gas passage tubes and a plurality of second mist separators to a fan causing said gas flow to exit said rotary contact processor through a gas exhaust;

a first pitot pump in said first scrubber chamber for liquid absorbent wash circulation and exit through a liquid absorbent outlet; and

a second pitot pump in said second scrubber chamber for liquid absorbent wash circulation and exit through a liquid absorbent water outlet.

9. (withdrawn) A rotary contact processor for direct contact liquid absorbent air contaminant processing comprising:

a carbon dioxide scrubber rotor in serial communication with an liquid absorbent scrubber rotor connected by a rotor shaft rotatably assembled on a plurality of bearings in a housing;

said carbon dioxide scrubber rotor in communication with an air inlet and a liquid absorbent inlet wherein a liquid absorbent is introduced as a mist into an air flow through said air inlet, said air flow introduced into a carbon dioxide scrubber chamber having a first heat and mass transfer surface therein of said carbon dioxide scrubber rotor;

said air flow passing through said carbon dioxide scrubber rotor through a plurality of first air passage tubes and a plurality of first mist separators to be introduced downstream into an acid wash scrubber chamber separated therefrom by a baffle and having a second heat and mass transfer surface therein;

said baffle having an acid water wash inlet for introduction of a liquid acid water wash as a mist in said air flow;

said air flow passing through said liquid absorbent scrubber rotor through a plurality of second air passage tubes and a plurality of second mist separators to a fan causing said air flow to exit said rotary contact processor through an air exhaust;

a first pitot pump in said carbon dioxide scrubber chamber for liquid absorbent circulation and exit through a liquid absorbent outlet; and

a second pitot pump in said acid wash scrubber chamber for liquid acid water circulation and exit through an acid water outlet.

10. (withdrawn) The rotary contact processor as in claim 9 wherein said liquid absorbent inlet and said liquid absorbent outlet are in communication with a liquid absorbent tank, a liquid absorbent heater and a stripper element.

11. (withdrawn) The rotary contact processor as in claim 9 wherein said acid water wash inlet and said acid water wash outlet are in communication with an acid water tank and an acid water cooler.

12. (Currently amended) A gravity independent method for removal of carbon dioxide and other trace contaminants from air used in environmental control, comprising the steps of:

introducing an air flow into a carbon dioxide scrubber rotor and spraying a liquid absorbent mist into said air flow;

rotating said carbon dioxide scrubber rotor to ~~separate~~ accumulate and remove said liquid absorbent containing absorbed carbon dioxide and trace contaminants from ~~said air flow~~ the carbon dioxide scrubber rotor;

~~accumulating said liquid absorbent on a first heat and mass transfer surface for extraction from said carbon dioxide scrubber rotor;~~

passing said airflow downstream of said carbon dioxide scrubber rotor through a plurality of first air passages and a plurality of first mist separators to a liquid absorbent scrubber rotor;

spraying a liquid acid wash into said air flow;

rotating said liquid absorbent scrubber rotor to ~~separate~~ accumulate and remove said liquid acid wash containing liquid absorbent, carbon dioxide and trace contaminants from ~~said air flow~~ the liquid adsorbent scrubber rotor;

~~accumulating said liquid acid wash on a second heat and mass transfer surface for extraction from said liquid absorbent scrubber rotor;~~ and

passing air flow downstream of said liquid absorbent scrubber rotor through a fan to an air exhaust, whereby carbon dioxide and other trace contaminants may be removed from the airflow in variable gravity environments.

13. (Currently amended) The method as in claim 12 wherein said extracted liquid absorbent is processed in a stripper element for reuse and wherein the pH of the accumulated acid wash is restored to a value of about 2 by addition of acetic acid .

14. (Currently amended) A method for reconditioning a contaminated liquid absorbent in a gravity independent environmental control system, comprising the steps of:

heating a liquid absorbent containing a carbonate to a decomposition temperature in a liquid absorbent heater;

communicating said liquid absorbent into a scrubber;

spraying said liquid absorbent onto a rotating heat and mass transfer surface for separation of said liquid absorbent from an absorbed carbon dioxide;

accumulating said liquid absorbent for extraction from said scrubber by rotating the heat and mass transfer surface and removing the accumulated liquid absorbent from the scrubber with a pitot pump; and

passing said carbon dioxide through a plurality of mist separators for output from said scrubber, whereby said reconditioning may be performed in variable gravity environments.

15. (Currently amended) The method as in claim 14 further comprising the steps of:

communicating said carbon dioxide into a second scrubber;

washing said carbon dioxide using a spray of a cold liquid absorbent;

spraying said cold liquid absorbent onto a rotating second-scrubber mass and heat transfer surface for separation of said cold liquid absorbent from said carbon dioxide;

accumulating said cold liquid absorbent for extraction from said second scrubber by rotating the second-scrubber heat and mass transfer surface; and

passing said carbon dioxide through a plurality of mist separators for output from said second scrubber.

16. (Original) The method as in claim 14 wherein said liquid absorbent is processed through a subsequent scrubber.

17. (Original) The method as in claim 15 wherein said cold liquid absorbent is processed through a subsequent scrubber.